Solar Energy in Vermont

Using solar energy to help heat our homes, provide natural lighting, heat domestic hot water, heat a pool or spa or provide electricity are all possible in Vermont. In the past ten years, thousands of Vermonters have installed solar systems ranging from simple sunspaces to advanced solar electric systems that provide reliable, clean energy. Every year advances in solar technology make systems more efficient, dependable and cost-effective.

Using solar energy is an exciting way to save on fuel bills and make our homes more comfortable. It also helps reduce our reliance on nonrenewable fossil fuels, which are a primary cause of acid rain and global warming, two of our most serious environmental problems. By investing in a solar energy system, you can save energy dollars and help protect our environment at the same time.

Every year, the energy equivalent of over 5 million kilowatt-hours of solar energy falls on each acre of land.

This consumer guide gives a brief introduction to solar technologies that work in Vermont. It also contains a listing of businesses specializing in solar energy design, systems and installation. And it contains useful facts about buying solar systems and where to find additional information.

Vermont's Solar Profile

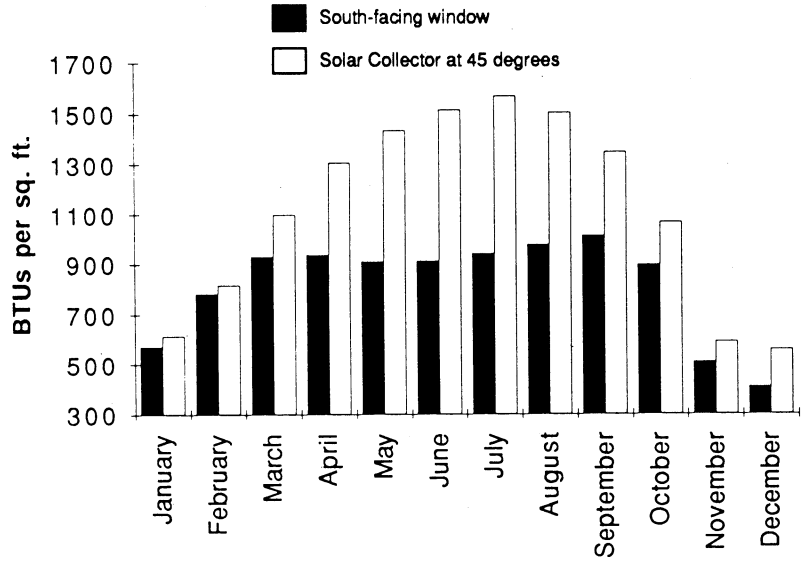
Vermont is known for long winters and a variable climate. It is also one of the cloudiest regions in the United States. In spite of this, Vermont enjoys a relative abundance of sunshine. Every year, the energy equivalent of over 5 million kilowatt-hours of solar energy falls on each acre of land.

The monthly *solar profile* of Vermont (Table 1) shows how much solar energy we receive each month on vertical surfaces such as

windows and tilted surfaces such as hot water collectors. This chart also shows the biggest challenge to using solar energy in Vermont — the seasonal differences of available solar energy from summer to winter.

Because of this seasonal variability and the difficulty of storing a large amount of energy, it is not economic to design most solar systems to deliver 100 percent of the energy needed year round. Solar hot water systems, for example, are usually designed to provide about 65 percent of the year-round energy "load" and use a back-up fuel source in the cloudier winter months. It is less expensive to install a back-up source of energy for a solar system than to oversize the system to handle the cloudiest month of the year.

Table 1: Vermont Solar Profile



Energy Efficiency Comes First

Nearly 40 percent of the energy we use in Vermont is consumed in homes and offices. Much of this is simply wasted heat and electricity. By designing buildings with better insulation and high-efficiency doors, windows and appliances, a building's energy use can often be cut in half.

For new construction, designing and building for maximum energy efficiency is always the best first step. Dollar for dollar, investments in energy efficiency will produce more energy savings and comfort than any other energy investment.

Existing homes and businesses can also benefit from energy-saving measures, such as insulating and air sealing. A trained energy auditor can develop a work plan for improvements that will give a building owner the maximum "energy dividend." Call the Vermont Department of Public Service for a listing of energy auditors.

Incorporating energy efficiency into a house is also important when considering an investment in a solar energy system. By lowering a home's energy use, a smaller, less expensive solar system is needed. In an energy-efficient home, more of the solar energy gained can be put to useful work. Thus, the solar system will have a higher overall efficiency and cost-effectiveness.